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EXAMINER	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/821,038	LI, SHAOLIN	
	Examiner	Art Unit	
	Chowdhury M. Shahriar	2609	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 April 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-32* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-32* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *04/07/2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. **Claims 1, 6, 21, 24, 27, and 30** are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 7,103,325 B1 *Jia et al.* in view of U.S. Patent 7,120,395 B2 to *Tong et al.*

As to **claim 1**, a method of operating a radio frequency (RF) signal processing circuit comprising the steps of:

a. Establishing a wireless communications channel between a first access point and a second access point in accordance with a communications protocol (*Jia* teaches that in his invention a radio frequency (RF) multi-antenna mobile terminal (read as access point) is implemented, figure 3, column 4, lines 41-50. The present invention teaches that the system comprises multi-antennas, a baseband processor and transmit and receive circuitry, which can be said as multi-antenna processor, figure 3, reference character 34,36,38,40, and column 4, lines 41-50. It can be said that any wireless transmitter or receiver establishes

connection between two wireless terminal or access points to perform their designated task.)

b. Monitoring transmission conditions in said wireless communications channel, including an available data rate, to determine whether a first transmission mode or a second transmission mode should be used (*Jia* teaches that the received information is decoded and demodulated base on channel matrix, figure 5, reference 94, column 7, Lines 51-65, which consistently stores information about channel condition. *Jia* disclose transmission and reception scheme of a multi-antenna system that uses channel condition to change the transmission-operating mode. *Jia's* present invention teaches that it adaptively controls coding and modulation techniques for transmission based on available spatial diversity and the quality of the channel or channels used for transmission, abstract, column 2, Lines 32-45, column 3, Lines 33-50 and column 5, Lines 51-54. Now that change of coding and modulation techniques will vary the data rate or bit error rate (BER) performance. Now it is up to the user whether they want to keep the data rate unchanged or BER unchanged depending on channel condition. So it can be said that this invention is capable of selecting operating mode.)

d. Performing a second set of signal processing operations at said first access point on M independent RF received signals from said second access point when said second mode of operation is used; wherein data transmissions between said first access point and said second access point are compliant with said communications protocol in both said first transmission mode and said

second transmission mode (*Jia* teaches that upon reception of multiple independent signals (for example, M number of signals) at multiple antennas (one at each antenna), it process, demodulate them, figure 5, reference 94, column 7, Lines 11-23. *Jia* teaches that the received information is decoded and demodulated base on channel matrix, figure 5, reference 94, column 7, Lines 51-65, which consistently stores information about channel condition. *Jia* disclose transmission and reception scheme of a multi-antenna system that uses channel condition to change the transmission-operating mode. *Jia's* present invention teaches that it adaptively controls coding and modulation techniques for transmission based on available spatial diversity and the quality of the channel or channels used for transmission (abstract, column 2, Lines 32-45, column 3, Lines 33-50 and column 5, Lines 51-54). So it can be said that this invention is capable of selecting operating mode.)

c. Performing a first set of signal processing operations at said first access point on a single received RF signal from said second access point when said first transmission mode is used *(Jia* teaches that in his invention a radio frequency (RF) multi-antenna mobile terminal (read as access point) is implemented, *Jia* teaches establishing a wireless communications channel between a first access point and a second access point, using M antennas to process M independent signal, selecting different mode of operation (changing code or modulation technique) based on channel condition. But *Jia* does not explicitly disclose change of antenna numbers (i.e. increasing number of antennas when channel is really bad or observe deep fading.) *Tong* teaches

selecting N antennas out of M antennas during transmission. N is here a variable number (can be one or more than one) and based on channel condition the different antennas are selected, means number N can be changed to enhance the capacity, signal-to-noise ratio or data rate, abstract, fig 6A-6C, 7A-C, 8A-C, column 2, lines 3-10, column 2, lines 16-22, column 8, Lines 31-33, column 13, Lines 58-63. *Jia* and *Tong* are analogous art because they are from same type of technical problem – MIMO wireless system. At the time of invention, it would have been obvious to a person of ordinary skilled in the art to make the above modification. The suggestion/motivation would have been to use MIMO system where different antennas are selected or changed to enhance the capacity, signal-to-noise ratio or data rate, abstract, fig 6A-6C, 7A-C, 8A-C, column 2, Lines 3-10, column 2, Lines 16-22, column 8, Lines 31-33, column 13, Lines 58-63. Therefore, it would have been obvious to combine *Tong* with *Jia* to address channel information vs. antenna number issue.)

As to **claim 6**, a method of claim 1 wherein said second set of signal processing operations is performed by a multiple-in, multiple out (MIMO) processor (*Jia* teaches that in his invention a radio frequency (RF) multi-antenna mobile terminal (read as access point) is implemented, figure 3, column 4, Lines 41-50. The present invention teaches that the system comprises multi-antennas, a baseband processor and transmit and receive circuitry, which can be said as multi-antenna processor, figure 3, reference character 34,36,38,40, and column 4, Lines 41-50. *Jia* teaches that upon reception of multiple independent signals

(for example, M number of signals) at multiple antennas (one at each antenna), it process, demodulate them, figure 5, reference 94, column 7, Lines 11-23. *Jia* teaches that the received information is decoded and demodulated base on channel matrix, figure 5, reference 94, column 7, Lines 51-65.)

As to **claim 21**, a method wherein said comprising:

Establishing a communications channel between a first access point and a second access point; (*Jia* teaches that in his invention a radio frequency (RF) multi-antenna mobile terminal (read as access point) is implemented, figure 3, column 4, Lines 41-50. The present invention teaches that the system comprises multi-antennas, a baseband processor and transmit and receive circuitry, which can be said as multi-antenna processor, figure 3, reference character 34,36,38,40, and column 4, Lines 41-50. It can be said that any wireless transmitter or receiver establishes connection between two wireless terminal or access points to perform their designated task.)

Monitoring transmission conditions in the communications channel; determining whether a first transmission mode or a second transmission mode should be used (*Jia* teaches that the received information is decoded and demodulated base on channel matrix, figure 5, reference 94, column 7, Lines 51-65, which consistently stores information about channel condition. *Jia* disclose transmission and reception scheme of a multi-antenna system that uses channel condition to change the transmission-operating mode. *Jia's* present invention teaches that it adaptively controls coding and modulation techniques for

transmission based on available spatial diversity and the quality of the channel or channels used for transmission, abstract, column 2, Lines 32-45, column 3, Lines 33-50 and column 5, Lines 51-54. Now that change of coding and modulation techniques will vary the data rate or bit error rate (BER) performance. Now it is up to the user whether they want to keep the data rate unchanged or BER unchanged depending on channel condition. So it can be said that this invention is capable of selecting operating mode.)

Performing a first set of signal processing operations at the first access point on a received signal from the second access point when the first transmission mode is used; and performing a second set of signal processing operations at the first access point on M independent received signals from the second access point when the second transmission mode is used *(Jia* teaches that in his invention a radio frequency (RF) multi-antenna mobile terminal (read as access point) is implemented, *Jia* teaches establishing a wireless communications channel between a first access point and a second access point, using M antennas to process M independent signal, selecting different mode of operation (changing code or modulation technique) based on channel condition. But *Jia* does not explicitly disclose change of antenna numbers (i.e. increasing number of antennas when channel is really bad or observe deep fading.) *Tong* teaches selecting N antennas out of M antennas during transmission. N is here a variable number (can be one or more than one) and based on channel condition the different antennas are selected, means number N can be changed to enhance the capacity, signal-to-noise ratio or data rate,

abstract, fig 6A-6C, 7A-C, 8A-C, column 2, Lines 3-10, column 2, Lines 16-22, column 8, Lines 31-33, column 13, Lines 58-63. *Jia* and *Tong* are analogous art because they are from same type of technical problem – MIMO wireless system. At the time of invention, it would have been obvious to a person of ordinary skilled in the art to make the above modification. The suggestion/motivation would have been to use MIMO system where different antennas are selected or changed to enhance the capacity, signal-to-noise ratio or data rate, abstract, fig 6A-6C, 7A-C, 8A-C, column 2, Lines 3-10, column 2, Lines 16-22, column 8, Lines 31-33, column 13, Lines 58-63. Therefore, it would have been obvious to combine *Tong* with *Jia* to address channel information vs. antenna number issue.)

As to **claim 24**, a method comprising:

Performing data transmissions during a first operating mode in a channel at a first access point (Please look at the response to claim 1 for this).

Performing data transmissions during a second operating mode in the channel at a first access point (Please look at the response to claim 1).

Receiving M independent modulated input signals from a second access point; processing the M independent modulated input signals extracting N independent data signals transmitted by the second access point.

Selecting the first operating mode and the second operating mode based on a transmission condition in the channel (Please see similar rejection to claim 1 where the obvious statement and motivation are also the same.)

As to **claim 27**, an apparatus comprising: means for establishing a communications channel between a first access point and a second access point; means for monitoring transmission conditions in the communications channel; means for determining whether a first transmission mode or a second transmission mode should be used; means for performing a first set of signal processing operations at the first access point on a received signal from the second access point when the first transmission mode is used; and means for performing a second set of signal processing operations at the first access point on M independent received signals from the second access point when the second transmission mode is used (Please look at the response of claim 21.) Please see similar rejection to claim 21 where the method is further taught by the apparatus as taught by fig 23 of *Jia* and fig 6A-6C of *Tong*.

As to **claim 30**, please see similar rejection to claim 24 where the method is further taught by the apparatus as taught by fig 23 of *Jia* and fig. 6A-6C, 7A-C, 8A-C of *Tong*.

3. **Claims 2, 3, 22,23,25, 28,29, and 31** are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 7,103,325 B1 *Jia et al.* in view of U.S. Patent 7,120,395 B2 to *Tong et al.*, as applied to claim 1 above, and further in view of U.S. PG Pub. 2004/0082356 A1 to *Walton et al.*

As to **claim 2**, a method of claim 1, wherein said second mode is automatically enabled when transmission conditions indicate that a data rate in said Channel has fallen below a predetermined threshold (*Jia* does not explicitly mentions about predetermined threshold, even though he teaches about selection of different scheme based on channel. *Walton* teaches the multi-antenna signal processing circuit is enabled and selectively operates in said second mode when channel conditions indicated that a data rate in said channel has fallen below a predetermined threshold, paragraphs 0658-0667. That means when the predetermined ratio is hampered the change between accesses periods occur. *Jia* and *Walton* are analogous art because they are from same type of technical problem – MIMO wireless system. At the time of invention, it would have been obvious to a person of ordinary skilled in the art to make the above modification. The suggestion/motivation would have been to use MIMO to receive or transmit signal and process changes operation, *Walton*, paragraph 0663, 0665. Therefore, it would have been obvious to combine *Walton* with *Jia* to address transmission condition vs. selection scheme issue.

As to **claim 3**, a method of claim 1, wherein said second mode is automatically enabled when transmission conditions indicate that a data rate in said channel is to be enhanced above a nominal operating rate (*Walton* teaches a MIMO WLAN system comprising access points and user terminals to provide high instantaneous data rates with greater coverage capabilities than conventional WLAN systems. *Walton* teaches a multi-antenna signal processing

circuit, figure 7, paragraph 0210, wherein said multi-antenna processing circuit is operated selectively to enhance an operating transmission range and/or operating data rate of one or more separate baseband processor, figure 7, paragraph 0044, a MIMO WLAN to provide high throughput with greater capabilities. Please see the similar motivation as claim 2).

As to **claim 22**, a method according to claim 21, further comprising: automatically enabling the second mode when transmission conditions indicate that a data rate in the channel has fallen below a predetermined threshold (Please look at the response of claim 2. Please see the similar motivation as claim 2).

As to **claim 23**, a method according to claim 21, further comprising: enabling the second mode when transmission conditions indicate that a data rate in the channel will be enhanced above a nominal operating rate (Please look at the response of claim 3. Please see the similar motivation as claim 3).

As to **claim 25**, a method according to claim 24, further comprising separating signals from different directions simultaneously, or nearly simultaneously, in a multi-antenna signal processing circuit (*Walton* teaches wherein space division multiple access is realized by separating different RF signals from different signal paths simultaneously in the single chip IC (paragraph 0042 and 0053, spatial processing is required at a receiver in order to process multiple data streams on the Ns spatial channels. *Jia* and *Walton* are analogous

art because they are from same type of technical problem – MIMO wireless system. At the time of invention, it would have been obvious to a person of ordinary skilled in the art to make the above modification. The suggestion/motivation would have been to use MIMO system where space division multiple access is realized by separating different RF signals from different signal paths, *Walton*, paragraph 0042 and 0053. Therefore, it would have been obvious to combine *Walton* with *Jia* to address space division multiple access issue.

As to **claim 28**, an apparatus according to claim 27, further comprising: means for automatically enabling the second transmission mode when transmission conditions indicate that a data rate in the channel has fallen below a predetermined threshold (Please see similar rejection to claim 2 where the method is further taught by the apparatus as taught by fig 23 of *Jia*).

As to **claim 29**, an apparatus according to claim 27, further comprising: means for automatically enabling the second transmission mode when transmission conditions indicate that a data rate in the channel will be enhanced above a nominal operating rate (Please look at the response of claim 3 and motivation are similar to the rejection of patent claim 3. Please also see similar rejection to claim 3 where the method is further taught by the apparatus as taught by fig 23 of *Jia and* fig. 7 of *Walton*.

As to **claim 31**, please see similar rejection to claim 25 where the method is further taught by the apparatus as taught by fig 23 of *Jia* and *Walton*, paragraph 0042 and 0053.

4. **Claims 7-14** are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 7,103,325 B1 *Jia et al.* in view of U.S. PG Pub. 2004/0082356 A1 to *Walton et al.*

As to **claim 7**, a method of performing multi-antenna radio frequency (RF) communications comprising the steps of:

Performing data transmissions during a first operating mode in a channel at a first access point using a first baseband processor; (*Jia* teaches that in his invention a radio frequency (RF) multi-antenna mobile terminal (read as access point) is implemented, figure 3, column 4, Lines 41-50. The present invention teaches that the system comprises multi-antennas, a baseband processor and transmit and receive circuitry, which can be said as multi-antenna processor, figure 3, reference character 34,36,38,40, and column 4, Lines 41-50.)

Performing data transmissions during a second operating mode in said channel at said first access point using a multi-antenna signal processing circuit, including the following steps: (a) receiving M independent RF modulated input signals from a second access point; (b) processing said M independent RF modulated input signals using a channel mixing matrix to extract N independent

data signals transmitted by said second access point (*Jia* teaches that upon reception of multiple independent signals (for example, M number of signals) at multiple antennas (one at each antenna), it process, demodulate them, figure 5, reference 94, column 7, Lines 11-23. *Jia* teaches that the received information is decoded and demodulated base on channel matrix, figure 5, reference 94, column 7, Lines 51-65.)

Wherein said first operating mode and said second operating mode are automatically selected based on a transmission condition in said channel (*Jia* discloses transmission and reception scheme of a multi-antenna system that uses channel condition to change the transmission-operating mode. *Jia's* present invention teaches that it adaptively controls coding and modulation techniques for transmission based on available spatial diversity and the quality of the channel or channels used for transmission, abstract, column 2, Lines 32-45, column 3, Lines 33-50 and column 5, Lines 51-54. So it can be said that this invention is capable of selecting operating mode. Also note that *Walton* teaches the multi-antenna signal processing circuit is enabled and selectively operates in said second mode when channel conditions indicated that a data rate in said channel has fallen below a predetermined threshold, paragraphs 0663, 0665. *Jia* and *Walton* are analogous art because they are from same type of technical problem – MIMO wireless system. At the time of invention, it would have been obvious to a person of ordinary skilled in the art to make the above modification. The suggestion and motivation would have been to use MIMO system, which selectively operates in said second mode when channel conditions indicated that a data rate in said

channel has fallen below a predetermined threshold, paragraphs 0663, 0665. Therefore, it would have been obvious to combine ~~Tong~~ Walton with *Jia* to address channel information vs. antenna number issue.)

As to **claim 8**, a method of claim 7, wherein said multi-antenna signal processing circuit processes at least 4 separate input signals. *Walton* discloses wherein said a RF multi-antenna access point system of claim 1, wherein said multi-antenna signal processing circuit processes at least 4 separate input signals representing a data stream multiplexed over 4 separate bit streams (*Walton* teaches the multi-antenna signal processing circuit processes at least 4 separate input signal representing a data stream multiplexed over 4 separate bit streams, figure 7, paragraph 0052-0056, each access point is equipped with 4 transmit and receive antennas where MIMO channel is formed by Nt transmit and Nr receive antennas and may be decomposed into Ns channels; paragraph 00459-00492, uplink, or signals received by the access point, spatial processing. See similar motivation used to reject the patent claim 7.)

As to **claim 9**, a method of claim 7, further including a step of using a channel mixing matrix to perform an operation that computes a recovered data signal x as follows: x-=-bl*yl+b2*y2+x0 where bl and b2 are equalization coefficients computed by said multi-antenna signal processing circuit, yl and y2 are received data from separate baseband channels, and x0 is a recovered signal from an adjacent channel (*Jia* teaches that upon reception of multiple

independent signals (for example, M number of signals) at multiple antennas (one at each antenna), it process, demodulate them, figure 5, reference 94, column 7, Lines 11-23. *Jia* teaches the received data is demodulated/decoded based on channel matrix, figure 5, reference 94, column 7, Lines 51-65.)

As to **claim 10**, a method of claim 7, wherein space division multiple access is realized by separating different RF signals from different directions simultaneously in the multi-antenna signal processing circuit (*Walton* teaches wherein space division multiple access is realized by separating different RF signals from different signal paths simultaneously in the single chip IC (paragraph 0042 and 0053, spatial processing is required at a receiver in order to process multiple data streams on the Ns spatial channels. See similar motivation used to reject the patent claim 7.)

As to **claim 11**, a method of claim 7, wherein said multi-antenna signal processing circuit extends a data transmission range achieved by said baseband processor circuit between said first access point and said second access point (*Walton* teaches a MIMO WLAN system comprising access points and user terminals to provide high instantaneous data rates with greater coverage capabilities than conventional WLAN systems. *Walton* teaches a multi-antenna signal processing circuit, figure 7, paragraph 0210, wherein said multi-antenna processing circuit is operated selectively to enhance an operating transmission range and/or operating data rate of one or more separate baseband processor,

figure 7, paragraph 0044, a MIMO WLAN to provide high throughput with greater capabilities. See similar motivation used to reject the patent claim 7.)

As to **claim 12**, a method of claim 7, wherein said multi-antenna signal processing circuit increases a data transmission rate achieved by said baseband processor circuit between said first access point and said second access point (Please look at the response of claim 11).

As to **claim 13**, a method of claim 7, wherein said multi-antenna signal processing circuit transmits M separate data signals to said second access point. (*Jia* discloses wherein said a RF multi-antenna access point system has multi-antenna signal processing circuit which transmits M separate data signals to said second access point, figure 3.)

As to **claim 14**, a method of claim 13, wherein a localized encryption is achieved for Said second access point by independently controlling said M separate transmission signals (*Walton* teaches that a localized encryption is achieved by independently controlling an energy modulation of separate transmission antennas used simultaneously by each of said M separate transmission signals, paragraph 0329-0355. See similar motivation used to reject the patent claim 7. See similar motivation used to reject the patent claim 7.)

5. **Claims 4 and 15** are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 7,103,325 B1 *Jia et al.* in view of U.S. Patent 7,120,395 B2 to *Tong et al.*, as applied to claim 1 above, and further in view of U.S. Patent 7,126,926 *Bjorklund et al.*

As to **claim 4**, a method of claim 1, wherein said communications protocol is based on an 802.1 lx communications protocol (*Jia* does not expressly disclose a signal that follows IEEE standard. *Bjorklund* teaches a multi-tier WLAN system for digital radio communication utilizing a first tier access point with relatively long-range radio connected to a second tier access point with relatively short-range radios to support various applications including the control of hotel door locks, individual room temperature control and remote video monitoring, abstract; figure 1, column 3, line 57 to column 5, line 50). Bjorklund also teaches the wired LAN (690) is connected to any (first tier) access point readily available on the market, column 3, line 66 to column 4, line 12, such as an IEEE 802.11 access point (640) as depicted utilizing wireless link (642) as opposed to a Bluetooth or RadPad protocol wireless link (646), figures 6 and 15, column 18, Lines 53-66. *Jia* and *Bjorklund* are analogous art because they are from same type of technical problem – signal processing with IEEE standard. At the time of invention, it would have been obvious to a person of ordinary skilled in the art to make the above modification. The suggestion and/or motivation would have been to use IEEE standard. Therefore, it would have been obvious to combine *Bjorklund* with *Jia* to address IEEE standard to process signal.)

As to **claim 15**, a method of transmitting and receiving data in a 802.1 lx compatible communications channel using a plurality of radio frequency (RF) received signals comprising the steps of: (a) operating a first baseband processor to handle data transmissions in a first mode between a first access point and a second access point in accordance with an 802.1 lx protocol, based on a first channel transmission condition; (b) operating a multi-signal processor to handle data transmissions in a second mode between said first access point and said second access point in accordance with an 802.1 lx protocol under a second channel transmission condition, during which time said multi-signal processor. receives M independent RF modulated input signals from said second access point; ii) processes said M independent RF modulated input signals using a channel mixing matrix to extract N independent data signals transmitted by said second access point; (c) transmitting an RF modulated signal to said second access point using a point coordination function (PCF) mode associated with said 802.1 lx protocol so as to maintain timing compatibility; wherein said multi-antenna signal processing circuit operates with a first baseband processor to receive and transmit RF signals in a channel between said first access point and said second access point.

(The response of this claim is similar to response of claim 1 and also in claim 7. Please take a look at the response to claim 1 and claim 7. Also note that there is a single difference between the claims. In claim 13, in access to claim 1,

it is claimed that the RF multi-antenna access point is compatible to 802.11x protocol.

Jia further does not expressly disclose a signal that follows IEEE standard. *Bjorklund* teaches a multi-tier WLAN system for digital radio communication utilizing a first tier access point with relatively long-range radio connected to a second tier access point with relatively short-range radios to support various applications including the control of hotel door locks, individual room temperature control and remote video monitoring, abstract, figure 1, column 3, line 57 to column 5, line 50. Bjorklund also teaches the wired LAN (690) is connected to any (first tier) access point readily available on the market, column 3, line 66 to column 4, line 12, such as an IEEE 802.11 access point (640) as depicted utilizing wireless link (642) as opposed to a Bluetooth or RadPad protocol wireless link (646), figures 6 and 15, column 18, lines 53-66. *Jia* and *Bjorklund* are analogous art because they are from same type of technical problem – signal processing with IEEE standard, figures 6 and 15, column 18, Lines 53-66. At the time of invention, it would have been obvious to a person of ordinary skilled in the art to make the above modification. The suggestion/motivation would have been to use IEEE standard. Therefore, it would have been obvious to combine *Bjorklund* with *Jia* to address IEEE standard to process signal).

6. **Claims 16,17, and 18** are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 7,103,325 B1 *Jia et al.* in view of U.S. Patent 7,120,395 B2 to *Tong et al.*, and further in view of U.S. Patent 7,126,926

Bjorklund et al. as applied to claim 15 above, and further in view of U.S. Patent 7,046,651 *Terry at al.*

As to **claim 16**, a method of claim 15, wherein said multi-signal processor processes data using, a high rate direct sequence spread spectrum (HR/DSSS) physical layer frame structure that has a preamble and header compatible with said 802.1 lx protocol (*Terry* teaches direct sequence spread spectrum (DSSS) is used in the physical layer data frame and 802.11x is designated protocol, column 1, line 30-45.

Jia does not explicitly disclose a signal that goes through a preamble acquisition that has header frame based on 802.11x standard. *Terry* teaches signal then goes through a preamble acquisition, has frame header etc. *Jia* and *Terry* are analogous art because they are from same type of technical problem – signal acquisition. At the time of invention, it would have been obvious to a person of ordinary skilled in the art to make the above modification. The suggestion/motivation would have been to use preamble acquisition technique, *Terry*, column 1, line 30-45. Therefore, it would have been obvious to combine *Terry* with *Jia* to address frame header issue.)

As to **claim 17**, a method of claim 16, wherein said header includes additional data to identify a high rate mode (*Terry* teaches the physical layer data frame has headers to identify data frame format such as data rate, modulation

etc., figure 5, and column 12, line 20-45. Please see similar rejection to claim 16 where the obvious statement and motivation are also the same).

As to **claim 18**, a method of claim 16, wherein said header includes additional data to identify a modulation format (*Terry* teaches the physical layer data frame has headers to identify data frame format such as data rate, modulation etc., figure 5, and column 12, line 20-45. Please see similar rejection to claim 16 where the obvious statement and motivation are also the same).

7. **Claim 20** is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 7,103,325 B1 *Jia et al.* in view of U.S. Patent 7,120,395 B2 to *Tong et al.*, as applied to claim 15 above, and further in view of U.S. Patent 7,126,926 *Bjorklund et al.* and further in view of U.S. Patent 5,383,164 *Sejnowski et al.*

As to **claim 20**, a method of claim 15, wherein said channel mixing matrix is blindly estimated using a Herault-Jutten network (*Jia* teaches mixing matrix estimation, but doesn't explicitly mentions about blindly estimation using a Herault-Jutten network. *Sejnowski teaches* about channel mixing matrix is blindly estimated using a Herault-Jutten network, figure 2. *Jia* and *Sejnowski* are analogous art because they are from same type of technical problem – signal acquisition. At the time of invention, it would have been obvious to a person of ordinary skilled in the art to make the above modification. The suggestion and motivation would have been to use a technique to estimate channel matrix,

Sejnowski, figure 2. Therefore, it would have been obvious to combine *Sejnowski* with *Jia* to address frame header issue).

8. **Claim 19** is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 7,103,325 B1 *Jia et al.* in view of U.S. Patent 7,120,395 B2 to *Tong et al.*, further in view of U.S. Patent 7,126,926 *Bjorklund et al.* as applied to claim 15 above, and further in view of U.S. Patent 7,006,464 *Gopalakrishnan et al.*

As to **claim 19**, a method of claim 15, wherein said multi-signal processor generates a dummy response signal to said second access point to mask a latency associated with decoding a received data packet (*Jia* does not explicitly disclose a cure for signal latency during decoding. *Gopalakrishnan* teaches an innovative solution where he uses an extra preamble (can be said as dummy signal), which helps to reduce decoding latencies, column 6, Lines 3-10. *Jia* and *Gopalakrishnan* are analogous art because they are from same type of technical problem – signal acquisition. At the time of invention, it would have been obvious to a person of ordinary skilled in the art to make the above modification. The suggestion/motivation would have been to use reduce decoding latencies, column 6, Lines 3-10. Therefore, it would have been obvious to combine *Gopalakrishnan* with *Jia* to address frame header issue.)

9. **Claim 5** is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 7,103,325 B1 *Jia et al.* in view of U.S. Patent 7,120,395 B2 to *Tong*

et al., as applied to claim 1 above, and further in view of U.S. Patent 7,006,464 *Gopalakrishnan et al.*

As to **claim 5**, a method of claim 1 wherein said second set of signal processing operations introduce a latency, and said latency is compensated using a dummy data response to maintain compatibility with said communications protocol (please look at the response of claim 19).

10. **Claims 26 and 32** are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 7,103,325 B1 *Jia et al.* in view of U.S. Patent 6,002,672 B2 to *Todd et al.*

As to **claim 26**, a method of operating a selective wireless data processing system comprising:

Monitoring at least one channel condition between two or more wireless access points (Please look at the response to claim 1).

Determining whether a threshold has been met for noise, interference, frequency fading, data rate and/or operating range on at least one channel between two or more wireless access points; responding to channel conditions (Please look at the response to claim 1).

And demodulating N separate data signals from M separate antennas simultaneously when channel conditions reach the threshold (*Jia* teach about MIMO system that can decode and demodulate N signals out M independent

received signal. But they do not explicitly teaches performing the selection of different schemes at the receiver based channel condition sensed at the receiver and also do not teaches clearly if the receiver is sending feedback information (feedback about channel condition and transmission characteristics) to the transmitter to adjust subsequent transmission. *Todd* teaches a diversity selection process for a wireless terminal having two antennas, which first collects channel info, evaluates the channel and then switches antennas accordingly, abstract, fig 2, column 2, line 31-36, column 4, line 31-50. *Jia* and *Todd* are analogous art because they are from same type of technical problem – reception of wireless signal using antenna diversity. At the time of invention, it would have been obvious to a person of ordinary skilled in the art to make the above modification. The suggestion/motivation would have been to increase performance of wireless transmission, abstract, fig 2, column 2, line 31-36, column 4, line 31-50. Therefore, it would have been obvious to combine *Todd* with *Jia* to address the diversity selection at receiver terminal).

As to **claim 32**, please look at the response of claim 26. Please see similar rejection to claim 26 where … Please see similar rejection to claim 26 where the method is further taught by the apparatus as taught by fig 23 of *Jia* and fig 2 of *Todd*.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chowdhury M. Shahriar whose telephone number is 571-270-3318. The examiner can normally be reached on Mon-Fri 8 AM:4 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Derrick Ferris can be reached on 571-272-3123. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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8/31/07

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